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This study attempted to determine whether or not there is a relationship between creativity, or divergent thinking, and bilingualism in fifth- and sixth-grade Florida students (20 monolingual Americans, 16 Greek-Americans, 17 Spanish-Americans, and 18 Czech-Americans). To assess the degree of bilingualism, the "Adapted Hoffman Bilingual Schedule" was used. Two tests were administered to determine creativity--a "Word Meanings" test in which the children were asked to supply as many meanings as possible for each of 25 American words, and a "Uses" test in which they were asked to list ways of using common objects. The bilingual students scored higher on the non-verbal "Uses" test and slightly lower on the "Word Meanings" test than did the monolingual students. Using the combined score, the bilinguals were generally higher--that is, more creative. Factors which may have influenced the results--degree of bilingualism, IQ, age, attitude toward experimenters, geographic location, rural versus urban environments, and socioeconomic and educational level of the family--were considered, but not, in all instances, controlled. (JS)

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JOHN F. JACOBS AND MARNELL L. PIERCE

Bilingualism and Creativity

Bilingual children, as such, have been studied since the early 1920's. The literature reporting these researches falls into roughly five categories: bilingualism and intelligence, bilingualism and emotional stability, bilingualism and language development, bilingualism and educational achievement, and reviews of the literature. However, it was not until the late 1950's and early 1960's that broadly based studies with large samples began to appear in the literature and inferences about bilingual children as a group could be drawn.

A survey of the literature has been done by Jensen (5) and contains an extensive bibliography.

Recently Getzels and Jackson (1), Torrance (8,9) Havighurst (3), and Lucito (6), among others, have been considering various aspects of creativity.

There do not seem to be any published studies in the English language considering creativity in bilingual children or the effects of bilingual-bicultural factors on manifestations of creativity in children. Upon consideration, there seemed to the authors good reason to suspect some relationship between bilingualism and creativity. The study described here was conducted to investigate the possibility of such a relationship.

Procedure

Four groups of children were considered: Group "A," 20 sixth-grade monolingual American students attending the Idylwild Elementary School, Gainesville, Florida; Group "C," 18 fifth- and sixth-grade students attending the Brooksville Elementary School, Brooksville, Florida, primarily Czechoslovakian, Polish, or German ancestry with bicultural-bilingual influences from the home and/or community; Group "G," 16 fifth- and sixth-grade students attending the Tarpon Springs Elementary School, Tarpon Springs, Florida, from Greek-American homes; and Group "S," 17 sixth-grade students attending the Orange Grove Elementary School, Tampa, Florida, from Spanish-American homes.

The principals of the four schools were asked to supply 15 to 20 children for testing. One entire sixth-grade class at the Idylwild School was used. Each of the other principals provided as many sixth graders as were available who were, to the principal's knowledge, of bilingual background. The balance of each experimental group was drawn from the fifth grades.

Instruments

Each child was interviewed individually in order to obtain the information necessary for the Hoffman Bilingual Schedule (4), as adapted. A "Word Meanings" test and a "Uses" test were administered to each group.

The first part of the Adapted Hoffman Bilingual Schedule consisted of questions such as number of siblings, educational level of parents, languages spoken in the home, date of birth, *etc.* The remainder of the schedule was designed to measure the degree of bilingual background for each child. Such questions as extent of second language usage with various members of the

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family, extent and language of reading matter used by members of the family, second language social and religious functions attended by the respondee and members of his family, *etc.* A scale of 0 to 4 was used for determining degree of bilinguality. A child with a 0.00 score would be considered to have almost no second language or second culture influences acting upon him. A child with a 4.00 would be considered monolingual or monocultural in the non-American language, having no American cultural or language influences in his environment.

The "Word Meanings" test presented 25 American words, each of which had at least two common meanings. Each child was asked to supply as many meanings for each word as he could. A child's score on this test was the total number of different meanings he was able to supply.

The "Uses" test presented five common objects (pencils, paper clips, toothpicks, paper, bricks, glass). Each child was asked to supply as many different uses for these objects as possible. A child's score on this test was the total of two separate parts: first, one point was allowed for each different use suggested for each object. Then one point was allowed for each uncommon use. (Uncommon uses were determined by group "A": any use that was given by more than one-fifth of the members of group "A" was considered a common use and all others were considered and scored as uncommon.)

The "Word Meanings" and "Uses" tests were used to determine "creativity," or possibly more appropriately, "divergent thinking" (2): the Word Meanings test measuring the degree of divergent thinking on a language-oriented scale, and the Uses Test, for a less language-bound test.

Results

On the tests of creativity, three separate scores were considered: The Uses score, the Word Meaning Score, and the combined score on these two instruments.

As a group, the monolinguals had a mean score of 31.25 on the Word Meaning test and 27.65 on the Uses test, for a total combined score of 58.90. The mean of the test scores of all bilingual children studied were: Word Meaning, 30.882; Uses test, 32.254; and combined score, 63.137. The bilinguals, when separated into language groups, scored as follows: Czech-Americans, 29.888 on the Word Meaning test, 39.000 on the Uses test, and 68.888 for the combined score; Greek-Americans, 36.5000 on the Word Meaning test, 34.000 on the Uses test, and 70.500 for the combined score; and Spanish-Americans, 26.64 on the Word Meanings test, 23.471 on the Uses test, and 50.118 for the combined score.

The combined bilingual population scored higher on the Uses test and on the combined score, ("t" = 1.27 and .93 respectively) and slightly, but not significantly, lower ("t" = .14) on the Word Meaning test.

Table 1

Creativity Scores

Group	*Mean Score*	*"t"*
Combined Scores		
Monolinguals	58.900	
Bilinguals (Combined)	63.177	.93
Czech-Americans	68.888	
Greek-Americans	70.500	
Spanish-Americans	50.118	
Uses Test		
Monolinguals	27.65	
Bilinguals (Combined)	32.35	1.270
Czech-Americans	39.000	
Greek-Americans	34.000	
Spanish-Americans	26.64	
Word Meanings		
Monolinguals	31.25	
Bilinguals (Combined)	30.882	.14
Czech-Americans	29.888	
Greek-Americans	36.500	
Spanish-Americans	26.64	

When the Czech-American and Greek-American children only were compared with the monolinguals, the differences were

much greater. The Spanish-American children scored significantly lower on both tests, but this difference may possibly be explained by a number of contributory factors; *e.g.*, lower socioeconomic level, coupled with a lack of or possibly negative motivation in the testing situation.

The intelligence level of the groups would not seem to account for the differences in test scores. When the children were matched by quartiles according to I.Q., the differences in creativity remained.

Table II

Creativity Scores By I.Q. Quartiles

	Monolingual	*Bilingual*	*B–M*	*"t"*
Quartile IV (I.Q. = 115+)				
Bilinguality	0.065	0.836	.799	3.072
Comb. Creativity	57.500	75.875	18.375	1.940
Uses	24.833	38.25	13.417	2.090
Word Meanings	32.666	37.625	4.859	.826
Quartile III (I.Q. = 100–114)				
Bilinguality	0.033	1.588	.555	9.29
Comb. Creativity	66.909	69.682	2.773	.426
Uses	33.181	36.27	3.089	.543
Word Meanings	33.727	33.085	−.682	−.230
Quartile II (I.Q. = 85 – 99)				
Bilinguality	0.032	1.208	1.176	6.157
Comb. Creativity	41.4	52.266	10.866	1.304
Uses	17.8	26.20	8.4	1.939
Word Meanings	23.4	26.006	2.666	.48
Quartile I (I.Q = 0–84)				

There was an insufficient number of children in this category to be considered.

Discussion

There were several factors which had possible bearing on the results. Among these were degree of bilingualism, I.Q., age, hostility towards or cooperation with experimenters, geographic location, urban or rural residence, socioeconomic level of family, educational level of family, *etc.* Attempts were made to control, or at least examine, as many of these variables as possible.

The mean ages of the four sub-groups varied from a low of 120.9 months to a high of 135.7 months. By groups the means were as follows: Monolingual children, 10.68 years (128.16 months); Greek-American children, 10.08 years (120.94 months); Spanish-American children, 11.26 years (135.08 months); and Czech-American children, 9.40 years (112.86 months). The mean for the monolinguals was 10.68 years, and for the combined bilingual group, 10.51 years, for a mean difference of .17 years ("t" = .41) (See Table III)

As was mentioned earlier, all of the monolingual children were in the sixth grade. In order to have a minimum of 15 bilingual children in each group, all bilingual children in the sixth grade at each of the schools providing bilingual children were used, and the remainder were fifth graders. Among the bilinguals, a total of 35 sixth graders and 16 fifth graders were used.

The degree of bilinguality of the groups was also considered. The monolingual children had a mean bilingual score of 0.039, and the combined bilingual mean was 1.248 on the Hoffman Bilingual Schedule. The Greek-American children had a mean bilingual score of 1.834; the Spanish-American 1.528; and the Czech-American, .514. The bilingual score of the monolingual children was primarily due to a knowledge of some words of Spanish learned from elementary school language study, either through educational television programs or a visiting language teacher. A few were third generation Americans who had learned some foreign language from grandparents and parents.

There did not seem to be any effective method of measuring the degree of hostility or cooperation within the scope of this study. However, subjectively, the monolingual children, the Greek-American, and the Czech-American children all seemed eager to cooperate and do well on the

instruments. The Spanish-American children, however, seemed to resent W.A.S.P. experimenters when they began the testing. During the individual interviews, however, rapport seemed to be established with these children and several remarked they wished they could go back and put more answers on their tests. It is the opinion of the authors that had the experimenters been of Spanish descent, or had they had an opportunity to establish rapport before administering the creativity instruments, the results for the Spanish-American group would have been significantly higher (10).

There did not seem to be any effective way of allowing for geographic location affecting the results. However, all four communities are within a sixty-mile radius in the state of Florida. Urban and rural differences may account for some differences in the results. It would probably be propitious to study the differences in creativity for urban and rural populations. This seemed especially true for the Uses test.

Table III
Urban-Rural and Socioeconomic Factors

Group	*Urban-Rural*	*Socio-Economic*	*Population of City*	*Uses Test* Scores
Spanish-American	Urban	Lower	302,000	23.47
Monolingual	Urban	Middle	54,000	27.65
Greek-American	Urban	Middle	6,800	34.00
Czech-American	Rural	Middle	450	39.00

The educational level of the parents would probably be expected to affect both the intelligence level and creativity levels of the children. In the present study, the mean number of years of schooling completed by the parents of the children studied were computed. The parents of the monolingual groups had a mean of 12.9 years of education completed while the bilingual group

Table IV
Summary of Data

	Monolinguals	*Combined Bilinguals*	*Czech-Americans*	*Greek-Americans*	*Spanish-Americans*
Number of Subjects	20	51	18	16	17
Degree of Bilingualism	.039	1.249	.464	1.834	1.528
Educational Level of Parents (Mean)	12.9	10.5	11.4	11.8	8.4
I.Q. (Mean)	106.23	112.74			
Age in Years	10.69	10.51	10.13	10.08	11.31
Word-Meanings Score	31.25	30.822	29.888	36.500	26.647
Uses Score	27.65	32.254	39.000	34.000	23.471
Combined Score	58.90	63.137	68.888	70.500	50.118

Factors Compared

Factor	*Mean of Monolingual*	*Mean of Bilinguals*	*Difference*	*"t"*
Academic level of Parents	12.9	10.5	2.5	.81
I.Q. of Subjects	106.23	112.74	6.51	2.179
Combined Creativity	58.96	63.137	4.237	.927
Uses	27.65	32.25	4.60	1.270
Word Meaning	31.25	30.88	.37	.148
Age of Subjects	10.68	10.51	.17	.41

mean was 10.500, a difference of 2.4 years ("t" = .81). Separating the bilingual group into language categories, the parents of the Czech-American group had completed 11.400 years of schooling; the Greek-American group mean was 11.8 years; and the Spanish-American group mean was 8.438 years.

In 1962, Peal and Lambert (7) conducted a large scale study investigating the relationship of bilinguality and intelligence. The present study would tend to support their findings. The mean Intelligence Quotient according to the school records of the combined group of bilinguals in this study was 112.74, and the mean of the monolinguals was 106.23, a difference of 6.51 ("t" = 2.179). Intelligence scores, as such, were not available for all bilinguals, nor had the same tests been used for each group.

Summary

Of the 51 children considered in the study, 20 were monolingual American, 16 were Greek-American, 17 were Spanish-American and 18 were Czech-American. The bilinguals scored considerably higher on the non-verbal "Uses" test of creativity, and slightly lower on the verbal "Word Meanings" test. The Combined score showed the bilinguals scoring considerably higher. When matched by quartiles for I.Q. the bilinguals still scored higher on the creativity tests. Bilinguals scored better, comparatively, on non-verbal tests than on the verbal. The bilingual children seem to have a significantly higher I.Q. score than the monolinguals in spite of the verbal orientation of the I.Q. tests used. There may also be an inverse relationship between the size of the community in which the child lives and the degree of non-verbal creativity displayed.

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